

BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application for Reissue of:

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U.S. Patent No. 5,873,235

Liquid Fuel Pressurization and Control Method

ABSTRACT

A liquid fuel pressurization and control system is disclosed which utilizes either a helical flow pump, or a helical flow pump followed by a gear pump, to pressurize liquid fuel to precisely the pressure level required by a turbogenerator's combustor injectors. This eliminates the need to overpressurize the fuel then regulate the fuel pressure down using a flow control valve or a pressure control valve. The shaft torque and shaft speed of the pump are controlled by the turbogenerator's power controller so as to assure that the turbogenerator's speed is precisely controlled (e.g. within ten (10) rpm out of one hundred thousand (100,000) rpm), and that its turbine exhaust temperature is precisely controlled (e.g. within two (2) degrees Fahrenheit out of twelve hundred (1200) degrees Fahrenheit) over the full range of turbogenerator electrical output power. The system also provides cool, high pressure air to assist atomization of the liquid fuel in the injectors utilizing a variable speed helical flow compressor. The system also adjusts the relative fuel flow through the multiple fuel injectors to aid flame stability at low turbogenerator speeds and low output power levels.